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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/931,458	08/16/2001	Nicholas Paul Cowley	534334-011	2970
27805	7590	10/03/2005	EXAMINER	
THOMPSON HINE L.L.P. 2000 COURTHOUSE PLAZA , N.E. 10 WEST SECOND STREET DAYTON, OH 45402			JONES III, CLYDE H	
			ART UNIT	PAPER NUMBER
			2611	

DATE MAILED: 10/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/931,458	COWLEY ET AL.	
	Examiner	Art Unit	
	Clyde H. Jones III	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1/2/2002</u> | 6) <input type="checkbox"/> Other: ____ |

by

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2,3,4, 7, 9, 11, 12, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rakib et al. (US 6,426,983 B1) in view of Domino et al. (US 6,259,752 B1).

Regarding claim 1, the following limitations read on Rakib in further view of Domino:

“tuner comprising an input section for converting a radio frequency signal to a sampled intermediate signal” (col. 4, lines 20-36; fig. 1 item 10; in which Rakib’s receiver unit (RU) is a “tuner” for receiving cable TV network channels);

“threshold generator for generating a threshold as a first function of an average of amplitudes of a plurality of samples of said intermediate signal” (col. 5, lines 13-20 – in which fig. 1, employs fig. 2; col. 5, line 60-col.6, line 25; in which Rakib’s detection and cancellation circuit – 36, fig. 2- generates an adaptable threshold based on the signals received);

“comparator for comparing said amplitude of each of said samples with said threshold” (col. 6, lines 5-10; in which Rakib’s detection and cancellation circuit 36 compares the amplitude of the samples to the threshold);

“corrector responsive to said comparator for setting to zero each of said samples whose amplitude is greater than said threshold”(col. 5, lines 47-58; col. 7, lines 1-16 & fig. 3; in which Rakib’s detection and cancellation circuit 36 sets frequency bins, i.e., frequency groups generated by a filter bank, with above threshold amplitudes to zero);

Rakib further discloses the average signal amplitude of a frequency bin containing an interference signal is higher than averages generated from **other** bins, which don’t have an interfering signal (col. 7, lines 55-65).

However, Rakib fails to disclose the limitation “threshold generator excluding from said average any of said samples whose amplitude exceeds said threshold”.

In an analogous art Domino discloses a system in an RF receiver that discards extremely high external interference signals from a running average of signal values, so that the erroneous signal does not abruptly change the running average (col. 7, lines 9-21).

It would be obvious to one skilled in the art at the time the invention was made to modify Rakib’s system to include the limitation “threshold generator excluding from said average any of said samples whose amplitude exceeds said threshold” as taught by Domino, so that a better running average of signal amplitudes could be used to generate the threshold, i.e., the running average would not be corrupted by extremely high interference signals (Domino – col. 7, lines 15-16).

In regards to claims 2, Rakib in view of Domino disclose the “corrector is arranged to set to zero n consecutive ones of said samples after each of said samples whose amplitude is greater than said threshold, where n is a positive integer” (Rakib – col. 8, line 62 – col. 9, line 2; in which Rakib’s system is **arranged** to erase, i.e., set to zero, samples adjacent/after the bin containing interference, so spilled out interference is removed from adjacent bins).

In regards to claims 3, Rakib in view of Domino disclose the “corrector is arranged to set to zero m consecutive ones of said samples before each of said samples whose amplitude is greater than said threshold, where m is a positive integer” (Rakib – col. 8, line 62 – col. 9, line 2; in which Rakib’s system is **arranged** to erase, i.e., set to zero, samples adjacent/before the bin containing interference, so spilled out interference is removed from adjacent bins).

Regarding claim 4, Rakib in view of Domino disclose the further limitation the “average is a moving average” (col. 6, lines 21-25; in which Rakib discloses an adaptive, i.e., moving, average calculating process).

Regarding claim 7, Rakib in view of Domino disclose “input section comprises a zero intermediate frequency converter” (Rakib - col. 4, lines 32-34; in which Rakib’s down converter converts the signal to baseband).

Regarding claim 9, Rakib in view of Domino disclose the “input section comprises an analogue/digital converter for forming said samples as digital samples” (Rakib - col. 4, lines 34-36).

Regarding claim 11, Rakib in view of Domino disclose “a fast Fourier transformer for processing said samples from said corrector” (Rakib - col. 9, 38-43; in which Rakib discloses use of the FFT for a simpler detection/cancellation algorithm and reduced performance requirements of the processor).

Regarding claim 12, the following limitations read on Rakib in further view of Domino:

“tuner comprising an input section for converting a radio frequency signal to a sampled intermediate signal” (col. 4, lines 20-36; fig. 1 item 10; in which Rakib's receiver unit (RU) is a “tuner” for receiving cable TV media through network channels);

“threshold generator for generating a threshold as a first function of an average of amplitudes of a plurality of samples of said intermediate signal” (col. 5, line 60-col.6, line 25; in which Rakib's detection and cancellation circuit – 36, fig. 2- generates an adaptable threshold based on the signals received);

“comparator for comparing said amplitude of each of said samples with said threshold” (col. 6, lines 5-10; in which Rakib's detection and cancellation circuit 36 compares the amplitude of the samples to the threshold);

“corrector responsive to said comparator for setting to zero each of said samples whose amplitude is greater than said threshold”(col. 5, lines 47-58; col. 7, lines 1-16 & fig. 3; in which Rakib’s detection and cancellation circuit 36 sets frequency bins, i.e., frequency groups generated by a filter bank, with above threshold amplitudes to zero);

Rakib further discloses the average signal amplitude of a frequency bin containing an interference signal is higher than averages generated from **other** bins, which don’t have an interfering signal (col. 7, lines 55-65).

However, Rakib fails to disclose the limitation “threshold generator excluding from said average any of said samples whose amplitude exceeds said threshold”.

In an analogous art Domino discloses a system in an RF receiver that discards extremely high external interference signals from a running average of signal values, so that the erroneous signal does not abruptly change the running average (col. 7, lines 9-21).

It would be obvious to one skilled in the art at the time the invention was made to modify Rakib’s system to include the limitation “threshold generator excluding from said average any of said samples whose amplitude exceeds said threshold” as taught by Domino, so that a better running average of signal amplitudes could be used to generate the threshold, i.e., the running average would not be corrupted by extremely high interference signals (Domino – col. 7, lines 15-16).

Regarding the further limitation “set top box” Rakib in view of Domino fail to specifically disclose it. However, the examiner takes official notice that it would have been obvious to one of ordinary skill in the art at the time the invention was made to

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modify Rakib's receiver unit to include a set top box for improving reception and decreasing susceptibility due to errors in the signal caused by local electromagnetic interference (e.g. noise impulse signals entering the set-top box from the switching on/off of a high power stereo amplifier near the STB).

Regarding claim 13, the following limitations read on Rakib in further view of Domino:

"television receiver comprising a tuner comprising an input section for converting a radio frequency signal to a sampled intermediate signal" (col. 4, lines 20-36; fig. 1 item 10; in which Rakib's receiver unit (RU) is a "tuner" for receiving cable TV media through network channels);

"threshold generator for generating a threshold as a first function of an average of amplitudes of a plurality of samples of said intermediate signal" (col. 5, line 60-col.6, line 25; in which Rakib's detection and cancellation circuit – 36, fig. 2- generates an adaptable threshold based on the signals received);

"comparator for comparing said amplitude of each of said samples with said threshold" (col. 6, lines 5-10; in which Rakib's detection and cancellation circuit 36 compares the amplitude of the samples to the threshold);

"corrector responsive to said comparator for setting to zero each of said samples whose amplitude is greater than said threshold"(col. 5, lines 47-58; col. 7, lines 1-16 & fig. 3; in which Rakib's detection and cancellation circuit 36 sets frequency bins, i.e., frequency groups generated by a filter bank, with above threshold amplitudes to zero);

Rakib further discloses the average signal amplitude of a frequency bin containing an interference signal is higher than averages generated from **other** bins, which don't have an interfering signal (col. 7, lines 55-65).

However, Rakib fails to disclose the limitation "threshold generator excluding from said average any of said samples whose amplitude exceeds said threshold".

In an analogous art Domino discloses a system in an RF receiver that discards extremely high external interference signals from a running average of signal values, so that the erroneous signal does not abruptly change the running average (col. 7, lines 9-21).

It would be obvious to one skilled in the art at the time the invention was made to modify Rakib's system to include the limitation "threshold generator excluding from said average any of said samples whose amplitude exceeds said threshold" as taught by Domino, so that a better running average of signal amplitudes could be used to generate the threshold, i.e., the running average would not be corrupted by extremely high interference signals (Domino – col. 7, lines 15-16).

Regarding claim 14, the following limitations read on Rakib:

"tuner comprising an input section for converting a radio frequency signal to a sampled intermediate signal" (col. 4, lines 20-36; fig. 1 item 10; in which Rakib's receiver unit (RU) is a "tuner" for receiving cable TV media through network channels);

"threshold generator for generating a threshold as a first function of an average of amplitudes of a plurality of samples of said intermediate signal" (col. 5, line 60-col.6,

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line 25; in which Rakib's detection and cancellation circuit – 36, fig. 2- generates an adaptable threshold based on the signals received);

“comparator for comparing said amplitude of each of said samples with said threshold” (col. 6, lines 5-10; in which Rakib's detection and cancellation circuit 36 compares the amplitude of the samples to the threshold);

“corrector responsive to said comparator for setting to zero each of said samples whose amplitude is greater than said threshold”(col. 5, lines 47-58; col. 7, lines 1-16 & fig. 3; in which Rakib's detection and cancellation circuit 36 sets frequency bins, i.e., frequency groups generated by a filter bank, with above threshold amplitudes to zero);

Rakib further discloses the average signal amplitude of a frequency bin containing an interference signal is higher than averages generated from **other** bins, which don't have an interfering signal (col. 7, lines 55-65).

However, Rakib fails to disclose the limitation “threshold generator excluding from said average any of said samples whose amplitude exceeds said threshold”.

In an analogous art Domino discloses a system in an RF receiver that discards extremely high external interference signals from a running average of signal values, so that the erroneous signal does not abruptly change the running average (col. 7, lines 9-21).

It would be obvious to one skilled in the art at the time the invention was made to modify Rakib's system to include the limitation “threshold generator excluding from said average any of said samples whose amplitude exceeds said threshold” as taught by Domino, so that a better running average of signal amplitudes could be used to

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generate the threshold, i.e., the running average would not be corrupted by extremely high interference signals (Domino – col. 7, lines 15-16).

Regarding the further limitation “television signal recorder” Rakib in view of Domino fail to specifically disclose it. However, the examiner takes official notice that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Rakib’s receiver unit to include a VCR with tuning capability (as is well known in the art) for improving reception and decreasing susceptibility due to errors in the signal caused by local electromagnetic interference (e.g. noise impulse signals entering the VCR from the switching on/off of a high power stereo amplifier near the STB).

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rakib et al. (US 6,426,983 B1) in view of Domino et al. (US 6,259,752 B1) and in further view of Staudinger et al. (US 6,407,634 B1).

Regarding claim 5, Rakib in view of Domino disclose a threshold that exceeds the calculated average by some predetermined amount (col. 5 line 65 – col. 6, line 9).

However, Rakib in view of Domino fail to disclose the “threshold is greater than a product of said average and a peak-to-average ratio of said intermediate signal”.

In an analogous art Staudinger discloses the error, i.e., distortion/interference, in a sampled signal ($V_{out}(t)$, fig. 1) is proportional to the product of the samples signal

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average ($E_{out(t)_{ave}}$) and the peak to time average value of the signal (H_D) (col. 4, line 64 – col. 5, line 8).

It would be obvious to one skilled in the art at the time of the invention to modify the system of Rakib in view of Domino to include the limitation “threshold is greater than a product of said average and a peak-to-average ratio of said intermediate signal” as taught by Staudinger because it is well known in the art that there is a higher probability that samples above the threshold would be caused by impulse interference.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rakib et al. (US 6,426,983 B1) in view of Domino et al. (US 6,259,752 B1) and in further view of Ma et al. (US 6,292,054 B1).

Regarding claim 6, Rakib in view of Domino disclose a threshold that exceeds the calculated average by some predetermined amount (col. 5 line 65 – col. 6, line 9).

However, Rakib in view of Domino fail to disclose the “threshold is greater than three times said average”.

In an analogous art Ma discloses a typical peak-to-average ratio for a CDMA standard transmission is 9.6 dB with a peaking probability of 10^{-4} , i.e., one in 10,000 peaks exceeds a certain threshold above average power (col. 3, lines 44-50, fig. 1 – item 14). Furthermore a peak-to-average ratio of 9.6 dB correlates to a maximum peak value of closely 3.02 times the average, i.e., $PEAK = 3.02 \cdot MEAN$, from the formula for converting the ratio of field strength values to decibels, e.g., $ratio_{dB} = 20$

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$\log_{10}(\text{value}_1/\text{value}_0) \rightarrow \text{ratio}_{\text{dB}}/20 = \log_{10}(\text{value}_1/\text{value}_0) \rightarrow \text{value}_1/\text{value}_0 = 10^{(\text{ratio}_{\text{dB}}/20)} \rightarrow$
 $\text{value}_1 = \text{value}_0 \cdot 10^{(\text{ratio}_{\text{dB}}/20)}$. Substituting 9.6 dB (the peak-to-average ratio) for ratio_{dB} in this formula yields $3.02 \cdot \text{MEAN} = \text{PEAK}$.

It would have been obvious to one skilled in the art at the time of the invention to modify the system of Rakib in view of Domino to include the limitation "threshold is greater than three times said average" as taught by Ma, so that the probability of the system suppressing interference signals and not payload data is higher (Ma - col. 3, lines 44-50, fig. 1 – item 14).

5. Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rakib et al. (US 6,426,983 B1) in view of Domino et al. (US 6,259,752 B1) and in further view of Pulley et al. (US 6,754,292, B1).

Regarding claim 8, Rakib in view of Domino disclose digital communication in any digital communication systems with strong interfering signal (col. 4, lines 9-12).

However Rakib in view of Domino fail to specifically disclose the "input section has in-phase and quadrature outputs for supplying said samples".

In an analogous art Pulley discloses a digital TV receiver/tuner with ADC that produces in-phase (I) and quadrature (Q) samples for decoding a DVB-T standard signal (col. 2, lines 1-13).

It would be obvious to one skilled in the art to modify the system of Rakib in view of Domino to include the limitation "input section has in-phase and quadrature outputs

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for supplying said samples" as taught by Pulley for decoding and processing DVB-T standard television signals (col.2, lines 1-6) and further it would have been well known to one skilled in the art that commercial quadrature signal processing components (e.g. hardware/software) are readily available.

Regarding claim 10, Rakib in view of Domino disclose digital communication in any digital communication system with strong interfering signals (col. 4, lines 9-12).

However Rakib in view of Domino fail to specifically disclose the limitation "a COFDM demodulator".

In an analogous art Pulley discloses a digital TV receiver/tuner receives DVB-T standard signals, which utilize the COFDM modulating technique (col. 2, lines 1-13).

It would have been obvious to one skilled in the art at the time the invention was made to modify the system of Rakib and Domino to include the limitation "a COFDM demodulator" as taught by Pulley for receiving and decoding DVB-T standard television signals (col.2, lines 1-6) and furthermore it is well known that signals transmitted using the COFDM technique resist different types of distortion/interference (e.g., multipath, burst noise, etc.) well.

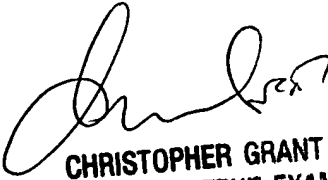
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Clyde H. Jones III whose telephone number is 571-272-5946. The examiner can normally be reached on 9-5:30 p.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Grant can be reached on 571-272-7294. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CJ



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